

EXHIBIT 4

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION**

United States of America, et al.)	
)	
Plaintiffs,)	
)	
v.)	Case No. 1:02cv00107
)	(Consol. with C-1-02-108 and
)	C-1-02-135)
The Board of County Commissioners, Hamilton County, Ohio)	
)	Judge S. Arthur Spiegel
)	Magistrate Judge Timothy S. Hogan
)	
Defendants.)	
)	
)	
)	

DECLARATION OF JEFFRY W. REXHAUSEN

I, Jeffry W. Rexhausen, state and declare as follows:

1. I am over 18 years of age and am competent to testify regarding the following:
2. I am an Associate Director of the Economics Center for Education and Research in the College of Business at the University of Cincinnati. I have spent nearly twenty years in the field of community and economic development analysis and planning, working with leaders from the public, private, and non-profit sectors to design and implement projects in response to diverse community issues. I earned my Master's degree in Planning and a baccalaureate degree in Urban Sciences from the University of Tennessee. My Curriculum Vitae is attached hereto at Tab A.
3. I worked with Dr. George Vredevelde, Director of the Economics Center, to perform an analysis of the financial and economic issues affecting the Metropolitan Sewer District of Greater Cincinnati. The Economics Center's analysis for this project was contained in a Declaration executed January 8, 2003, which is attached hereto at Tab B ("Vredevelde Declaration"). The Economics Center has continued to analyze these issues.
4. I have reviewed the unsigned and undated Supplemental Declaration of Michael Kavanaugh, Ph.D. ("Kavanaugh Supplemental Decl."). The household burden imposed by the actual and projected costs of providing service and implementing the proposed consent decree is significantly underestimated by Dr. Kavanaugh as a result of certain assumptions that are questionable, and because of a number of omissions or

miscalculations. These errors result in Dr. Kavanaugh's dramatic understatement of the financial burden of total program expenditures.

5. **Kavanaugh Overestimates the Number of Households:** Dr. Kavanaugh overestimates the number of households, and consequently, the number of residential users that will contribute to program costs. Kavanaugh only discounts for households in those portions of Hamilton County that are outside of MSD's service area, Kavanaugh Supplemental Decl. ¶14.b & n.10, whereas the analysis used in the Vredevelde declaration also subtracts households in unsewered areas, which should not be included in the customer base because they neither receive nor pay for sewer service.
6. **Kavanaugh Underestimates the Residential Share:** Dr. Kavanaugh underestimates the percentage of total wastewater costs attributable to residential users (the "residential share"). He also fails to account for the fact that the residential share is increasing. *See* Vredevelde Decl. ¶ 27. New information corroborates the trend discussed in the Vredevelde Declaration. The 2003 Report on Wastewater Rates for the Metropolitan Sewer District prepared by Black and Veatch, (which I understand to have been submitted as an exhibit to Defendants' Memorandum Accounting for Expenditures), bears out the forecast of increasing residential share and disproves Kavanaugh's thesis that the residential share will remain constant: between 1999 and 2003, the residential share has increased from 67% to 74%. Kavanaugh's analysis not only fails to account for the trend, but also ignores entirely the 2003 rate study data, which demonstrates that the current residential share is significantly higher than the figure he uses in his Declaration.
7. **Kavanaugh Overestimates the Median Household Income (MHI) and Future Growth in MHI.** Dr. Kavanaugh overstates the MSD Area MHI and compounds the error by assigning an unreasonable growth rate to the residents' real income. A careful analysis of 2000 Census data for areas served by MSD sewers produced the MHI estimate of \$39,348. Vredevelde Decl. ¶ 11. Kavanaugh's estimate is based on wrongly including more affluent areas within Hamilton County that are unsewered and do not receive (or pay for) MSD Service. An even greater flaw in Kavanaugh's analysis is the assumption—which relies on regional (not county) projections developed from a national model—that the MHI will "grow at 3.5% per year from its base level of \$40,000 in 1999." Kavanaugh Supplemental Decl. ¶ 14.i. To the contrary, a more reasonable assumption is that Hamilton County's thirty-year trend in real income stagnation and declining economic position within the Cincinnati metropolitan area will continue. Vredevelde Decl. ¶11(c).
8. **Kavanaugh Does Not Count Existing Debt Service Obligations.** Dr. Kavanaugh states that he is using the debt schedule from the November 2, 2001 Official Statement. Kavanaugh Supplemental Declaration ¶14.h. This data is old, as Defendants issued another bond in June 2003. But more importantly, while Kavanaugh shows existing debt in the spreadsheets found in his Appendix,¹ his formulas omit *all* of this debt from his

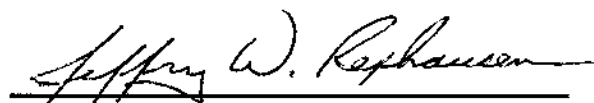
¹ The Appendix is cited in the Kavanaugh's Supplemental Declaration, *see* notes to Table 1 and 2 at page 8, but was not included in the filing. The Appendix was provided to the Economics Center electronically by attorneys for Defendants. The relevant excerpt of the attachment is attached hereto at Tab C. In each table, the formula for

calculations of total costs, rates, and burden. Putting these combined errors into perspective, Dr. Kavanaugh fails to count over \$710 million in *existing* obligations (from 2004-2022) in his analysis.

9. **Kavanaugh Omits Costs of Debt Cover.** Dr. Kavanaugh also omits consideration of the reserve requirements for debt service coverage. In order to maintain a good bond rating, Defendants have historically maintained at least a reserve equal to 175% of one year's debt service coverage.
10. In addition, Dr. Kavanaugh asserts that the Vredevelde Declaration relied on "a budget document that includes depreciation." Supplemental Kavanaugh Decl. at 4 n.7. This is factually incorrect. Depreciation is used in financial statements, not budget documents. Depreciation is not included in the numbers used in the Economics Center's analysis, so the referenced analysis does not include any "double counting" as Kavanaugh suggests. See Supplemental Kavanaugh Decl. at 4 n.16.
11. These errors cause Kavanaugh to dramatically understate MSD ratepayers' expected future obligations and likely overstates the future financial status of ratepayers who will be paying for service.² In my opinion, Dr. Kavanaugh's full analysis is not a reasonable estimate of either total program costs or households' ability to pay, and consequently underestimates financial burden and overstates Defendants' financial capability.

I swear under penalty of perjury that the foregoing is true to the best of my knowledge and belief.

Executed this 12th day of May.


Jeffrey W. Rexhausen

total costs is "cumulative debt service + SSO/CSO/WIB operating expense + operating expense," but it fails to count existing debt service.

² There are other questionable assumptions underpinning Dr. Kavanaugh's analysis that give his analysis an overly optimistic portrayal of Defendants' financial capability, including: costs associated with program expenditures, for example, the costs of programs, such as the asset management program, and the future costs of construction as compared to income growth.

TAB A

Jeff Rexhausen

Associate Director of Research, Economics Center for Education & Research

University of Cincinnati
PO Box 210223
Cincinnati, OH 45221-0223
(513) 556-3047 Telephone
(513) 556-2953 Fax
jeff.rexhausen@uc.edu

Education

B.A., *Urban Sciences*, University of Tennessee, 1977
M.S.P., *Planning*, University of Tennessee, 1981

Past Employment

Vice President, PMD, Inc. / ServiceTRAC (Cincinnati OH / Scottsdale AZ), 1998-2001.

Director of Planning and Research, Archdiocese of Cincinnati (Cincinnati OH), 1989-1998.

Development Services Coordinator, Northern Kentucky Area Development District (Florence KY), 1988-1989.

Vice President, Project Market Decisions, Inc. (Cincinnati OH), 1988-1991.

Project Manager and Economic Analyst, Public Demographics, Inc. (Cincinnati OH), 1982-1987.

Research Assistant, Regional & Urban Studies Section and Data & Analysis Section, Oak Ridge National Laboratory (Oak Ridge TN), 1979-1982.

Selected Recent Publications

- * Rexhausen, Jeff, with Michael Cieslak, Mary L. Gautier and Robert J. Miller (forthcoming). A National Study of Recent Diocesan Efforts at Parish Reorganization in the United States: Pathways for the Church of the 21st Century. Kucera Center: Dubuque IA.
- * Rexhausen, Jeff, with Kanchan Sawke (2004). The Economic Impact of the National Underground Railroad Freedom Center on Greater Cincinnati. Economics Center for Education & Research: Cincinnati.
- * Rexhausen, Jeff, with Christina M. L. Kelton and Lisa A. Schlafer (2003). The Economic Impact of Cincinnati Children's Hospital Medical Center on Greater Cincinnati. Economics Center for Education & Research: Cincinnati.
- * Rexhausen, Jeff, with Kanchan Sawke and Lisa A. Schlafer (2003). Clermont County Economic Base Analysis. Economics Center for Education & Research: Cincinnati.
- * Rexhausen, Jeff (2003). Review of Socioeconomic Issues in the Draft Technical Support Document for the Identification of Chesapeake Bay Designated Uses and Attainability. Economics Center for Education & Research: Cincinnati.
- * Rexhausen, Jeff (2003). Report to the Greater Cincinnati Water Works on the Economic Implications of the Proposed Outflow for the New Wastewater Treatment Plant in Northern Kentucky. Economics Center for Education & Research: Cincinnati.
- * Rexhausen, Jeff (2003). The Economic Impact of Implementing the Cincinnati Public Schools' Facilities Master Plan on Greater Cincinnati. Economics Center for Education & Research: Cincinnati.

- * Rexhausen, Jeff (2003). 2002 Capital Investment Survey Analysis (for Greater Cincinnati). Economics Center for Education & Research: Cincinnati.
 - * Rexhausen, Jeff (2002). 2002 Residential Development Survey of Planning and Development Officials in Southwest Ohio & Northern Kentucky. Economics Center for Education & Research: Cincinnati.
 - * Rexhausen, Jeff (2002). Renaissance On The River: The Impact Of Major Riverfront Developments And Other Major Attractions In The City Center Of Cincinnati USA. Economics Center for Education & Research: Cincinnati.
 - * Rexhausen, Jeff (2001). An Economic Model to Project Sales Tax Revenues for Hamilton County. Economics Center for Education & Research: Cincinnati.
- Nowell, William and Jeff Rexhausen (2001). Achieving Sales Success: Key Ratios and Best Practices in Assisted Living Properties. Johns Hopkins Seniors Housing & Care Journal, 9:73-84.

Recent Funded Research Projects

All asterisked publications listed above, plus:

- * National Study of Adult Day Services 2001-2002, with Michael J. Starke, et al (2002, funded by the Robert Wood Johnson Foundation)
- * The Economic Impact of Cincinnati's Red Hot Weekend (2002)
- * Cox Road & Ohio 129 Development: Economic Impact Summary (2002)
- * An Analysis of Tax Structure Options for Transit Funding (2002)
- * The Economic Impact of Capital University (2002)
- * The Economic and Fiscal Impact of the Greentree Road Interchange (2002)
- * The Economic Impact of the Cincinnati Museum Center on Greater Cincinnati (2002)
- * Economic Impact of The Cincinnati Institute of Fine Arts (2002)
- * Partnership for Greater Cincinnati: 2001 Capital Investment Survey Analysis (2002)
- * Distribution of Fiscal Impacts of Rickenbacker International Airport and Foreign-Trade Zone No. 138 for Selected Jurisdictions (2001)
- * Homeowner Tax Credit Analysis: An Analysis of the Fiscal Impact of Historic Rehabilitation Tax Credit Legislation on Kentucky State Revenues (2001)

Honors and Awards

Honorable Mention, paper submitted for Johns Hopkins Seniors Housing & Care Journal, 2001
Research Award, Graduate School of Planning, The University of Tennessee at Knoxville, 1981
College Scholar, College of Liberal Arts, The University of Tennessee at Knoxville, 1977

TAB B

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

United States of America, et. al.,

Plaintiffs,

Sierra Club, et. al.,

Intervenors,

v.

The Board of County Commissioners
of Hamilton County

&
The City of Cincinnati

Defendants.

Case No. 1-02-107

(Consol. with C-1-02-108 and
C-1-02-135)

Judge S. Arthur Spiegel
Magistrate Judge Timothy S. Hogan

DECLARATION OF GEORGE M. VREDEVELD, Ph.D.

I, George M. Vredeveld, state and declare as follows:

1. I am over 18 years of age and am competent to testify regarding the following:
2. I am a Professor of Economics and the Director of the Economics Center for Education and Research at the University of Cincinnati. I regularly conduct economic and demographic studies and provide data and analysis for business and public organizations. My recent research has focused on factors that affect regional economic development, including studies on the linkage of downtown to the suburbs in Cincinnati, labor markets in our region, and the role of education in meeting the needs of industry. In addition to research on the local economy, have analyzed the effects of unifying the economies of the European Union and the economic changes in Central and Eastern Europe. I was a member of a task force, commissioned by the Bulgarian government, that developed an economic transformation program for that country. I received my B.A. from Calvin College, a masters degree from Purdue University and a PhD in economics from Indiana University. My curriculum vitae is attached.

3. The Economics Center for Education and Research at the University of Cincinnati performed an analysis of financial and economic issues affecting the Metropolitan Sewer District of Hamilton County (MSD) and its ability to undertake new or expanded program expenditures.
4. This analysis begins with a Financial Capability Assessment, based on the USEPA Guidance entitled *CSO Guidance for Financial Capability Assessment and Schedule Development* (published March 27, 1997). The USEPA assessment approach includes a) an assessment of Financial Indicators, b) development of the Financial Capability Indicators Score, and c) an assessment of Household Affordability.
5. Financial Indicators. The EPA guidance for financial capability assessment is intended to assist communities in determining their capacity for implementing rate increases that will permit implementation of necessary programs while avoiding the imposition of substantial and widespread adverse economic impacts. This assessment examines financial indicators for MSD in three USEPA-defined categories: Debt Indicators, Socioeconomic Indicators, and Financial Management Indicators.
6. Debt Indicators are: a) Bond Rating, and b) Net Debt as a Percent of Full Market Property Value.
7. Bond Rating. During the second half of 2001, Hamilton County conducted a sale of bonds for several projects, including water line extensions. In its November 13, 2001 e-newsletter (see "Hamilton County's successful bond sales and refinancing saves millions" at http://www.hamilton-co.org/Newsletter/Nov_13_2001/Hcc_Nov_13_2001.htm), the County reported that, in the course of the sales process, Moody's Investors Service reaffirmed the County's Aa2 bond rating. Bonds within the general "Aa" category are considered to be "high grade" or "high quality" bonds. The "Aa2" classification is surpassed only by "Aaa" and "Aa1." This bond rating receives the "Strong" rating on the USEPA benchmarks.
8. Net Debt as a Percent of Full Market Property Value. The *2001 Comprehensive Annual Financial Report*, issued by the Hamilton County Auditor in June 2002 (<http://www.hamiltoncountyauditor.org/pdf/cafr2001.pdf>), contains the latest information on the total debt of the County and all overlapping debt. The net debt figure reported on page 127 is \$1,088,391,000 (as of December 31, 2001). The total estimated actual value of all real property in the County is \$40,892,677,000 for the 2001 collection year. Using these two figures results in a net debt percentage calculation of 2.66%. This debt level receives the "Mid-range" rating on the USEPA benchmarks.
9. Socioeconomic Indicators are: Unemployment Rate, Median Household Income, and Other Socioeconomic Conditions and Trends.
10. Unemployment Rate. The Economics Center used Census Bureau ratios combined with current BLS data to develop unemployment estimates for the actual MSD Area (the area served by its sewers, as shown by the map in MSD's annual report, which can be found at: http://www.msdcg.org/downloads/annual_report/MSD_annual_report_2001.pdf).

- a. Based on data for the most recently completed quarter¹ (third quarter of 2002), the national unemployment rate was 5.7 percent while the rate for the MSD Area was 5.3 percent (from: <http://data.bls.gov/labjava/outside.jsp?survey=la>). When compared to the national figure, the MSD Area unemployment rate receives the "Mid-range" rating on the USEPA benchmarks.
- b. Such a rating overlooks two important factors. First, while the national figure has increased about 20 percent over the past year (see the table below), the MSD Area unemployment rate has increased by about 30 percent. Second, and more important, the MSD Area is weakening in relation to the surrounding area, which is the context in which it must compete economically. While the MSD Area had an unemployment rate comparable to that of the balance of the CMSA a year ago, its current rate of 5.3 percent is much higher than the rate for the balance of the CMSA. This suggests that the local economy may actually be splitting into two categories, a struggling core that is losing jobs but with a growing concentration of people unable to find work, and a competitive suburban ring where the economy is stable. Thus, in terms of unemployment, the MSD Area is in a position that can also be described as "Weakening" and significantly below the rest of its economic region.

Unemployment Rates ²		
	2001,Q3	2002,Q3
U.S.	4.8%	5.7%
MSD Area	4.1%	5.3%
Hamilton County	3.8%	5.1%
Balance of CMSA	3.9%	4.3%

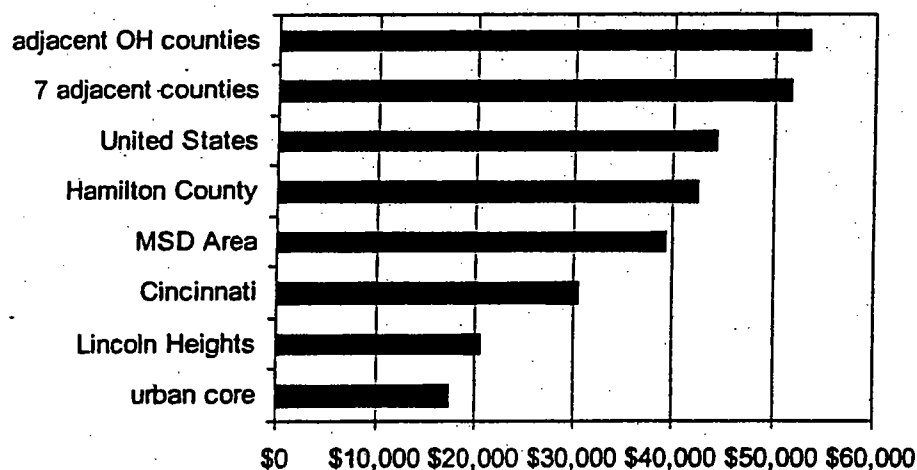
- c. Differences in conditions within an economic region are important because businesses are often able to gain a competitive advantage by moving to lower cost locations within the region. Similarly, households will look for locations where they can maximize benefits and minimize costs. These economic forces often can combine to create disinvestments in urban core areas.
11. Median Household Income. The Consumer Price Index is the basis for adjusting all 2000 Census income statistics; the national CPI change is used to estimate the 2002 United States median household income, while the Cincinnati CMSA CPI change is used to estimate MHI for all other areas. (See the CPI website: <http://www.bls.gov/cpi/home.htm#data>.)
- a. The United States median household income estimate of \$44,421 is 12.9 percent higher than the MSD Area estimate of \$39,348. Based on this comparison, the MSD Area median household income receives the "Mid-range" rating on the USEPA benchmarks.

¹ We use quarterly unemployment data because of the high variability of monthly data at the local level. Averaging over three months gives a more accurate picture.

² The national figures are not seasonally adjusted in order to compare with area figures, which are unadjusted.

- b. When the median household income for the MSD Area is put in the context of the surrounding region and trends over time, however, it fares much worse. The median of \$51,574 for the seven adjacent counties in Indiana, Kentucky, and Ohio is 31.1 percent higher than that of the MSD Area, and the median for the three adjacent Ohio counties is \$53,346, 35.6 percent higher.
- c. Hamilton County has been steadily falling behind the rest of the region over the past three decades. It ranked fifth among the eight counties in median household income in the 1970 Census, sixth in 1980, seventh in 1990, and last in 2000. Adjusted for inflation, Hamilton County's median household income is unchanged from 1970 to 2000, while the nation's has increased by 17 percent and all surrounding counties have had increases of 10.8 percent to 31.4 percent
- d. Using an area-wide median household income can also obscure large communities where incomes are much lower. In this regard, it is noteworthy that the national median is 44.9 percent higher than the \$30,697 median for the city of Cincinnati, not to mention other pockets of poverty such as the city of Lincoln Heights where the median household income is only \$20,576, and the urban core, where it is \$17,301. These comparisons, shown in the following chart, indicate relatively less affluence in the MSD Area, and especially in its largest and poorest communities, and they offer a compelling basis for characterizing the MSD Area's rating in this area as "Weak."

2002 Median Household Income



12. Other Socioeconomic Conditions and Trends. Two additional factors can help to clarify the socioeconomic status of the MSD Area: its declining population and its competitive disadvantage within the region.

- a. **Population Decline.** Hamilton County is a county at risk of experiencing a dramatic decline. Since 1970, when the County's population peaked at 924,018, every census has shown a decrease in its population. The 2000 Census figure of 845,303 is 8.5 percent below the 1970 level. Even more troubling is the latest Census Bureau estimate that

Hamilton County's population declined 1.2 percent in the fifteen months between April 1, 2000 and July 1, 2001, the third largest rate of decline among the nation's 100 largest counties.

- b. **Regional Competitiveness.** The County is already at a substantial competitive disadvantage in comparison to its neighbors. Hamilton County's population decline of 2.4 percent from 1990 to 2000 stands in marked contrast to the 18.6 percent increase for the seven surrounding counties, and a 20.4 percent growth rate for the three adjacent Ohio counties of Butler, Warren, and Clermont. As noted earlier, this disparity extends to other measures as well: the median household income in the surrounding counties is much higher and the residential property tax millage rates are much lower. All of these statistics indicate that Hamilton County already faces a considerable challenge in competing for residents.

13. **Financial Management Indicators are: Property Tax Revenues as a Percent of Full Market Property Value, and Property Tax Revenue Collection Rate.**

14. **Property Tax Revenues as a Percent of Full Market Property Value.** According to information produced by the Ohio Department of Taxation in January 2002 (see http://www.state.oh.us/tax/Publications/Tax_Data_Series/PD30/pd30cy00.htm), total property tax collections within Hamilton County in 2000 amounted to \$1,031,746,000. This is 2.1 percent of the County's estimated full market property value of \$40,551,923,000 for the 2000 year.

- a. This revenue level receives the "Mid-range" rating on the USEPA benchmarks. However, this figure of 2.1 percent is markedly higher than the comparable figure of 1.7 percent for the three adjacent Ohio counties of Butler, Warren, and Clermont. Such a difference imposes a substantial constraint on the ability of jurisdictions within Hamilton County to raise tax rates, since they are already at a competitive disadvantage as a result of having higher tax rates. The difference can be more precisely calculated by comparing the millage rates for residential property and for commercial and industrial property.
- b. Using data obtained by the Ohio Department of Taxation from county auditors' offices (http://www.state.oh.us/tax/Publications/Tax_Data_Series/PR6/pr6cy00.htm), it is possible to compare the millage rates for Hamilton County with weighted average rates for the three adjacent Ohio counties. The following table shows that the residential rate for Hamilton County is 23 percent higher, and the commercial and industrial rate is 31 percent higher. Consequently, this indicator may more appropriately be classified as "Weak."

Property Tax Millage Rates		
	Residential	Commercial & Industrial
Hamilton County	53.6	60.5
adjacent OH counties	43.5	46.2
millage difference	23.2%	31.0%

15. **Property Tax Revenue Collection Rate.** In March of 2002, The Ohio Department of Taxation reported that Hamilton County's property tax collection rate for the 2000 tax year was 93.3 percent. This collection rate receives the "Weak" rating on the USEPA benchmarks. Using data obtained by the Ohio Department of Taxation from county auditors' offices (http://www.state.oh.us/tax/Publications/Tax_Data_Series/PR6/pr6cy00.htm), it is possible to compare the tax delinquency rate for Hamilton County with a weighted average rate for the three neighboring Ohio counties of Butler, Warren, and Clermont. Hamilton County's delinquency rate of 6.7 percent is approximately 40 percent higher than the average rate of 4.8 percent for the adjacent counties.
16. **Overall.** Together, the debt, socioeconomic, and financial management indicator benchmarks produce MSD's Financial Capability Indicators Score. Based on the preceding analysis of intra-regional disparities, trend scores are used in three cases: unemployment rate, median household income, and property tax rate. The following table displays MSD's actual values for each item, the benchmark rating, and two sets of scores, one based strictly on the USEPA benchmarks (Initial Score), and the other taking trends and intra-regional disparities into consideration (Trend Score).

Metropolitan Sewer District Financial Capability Indicators				
Indicator	Actual Value	Rating on Benchmark	Initial Score	Trend Score
DEBT				
Bond Rating	Aa2	Strong	3.0	3.0
Net Debt as % of Full Market Value	2.66%	Mid-range	2.0	2.0
SOCIOECONOMIC				
Unemployment Rate ¹	5.9%	Mid-range	2.0	1.0
Median Household Income ²	\$39,348	Mid-range	2.0	1.0
FINANCIAL MANAGEMENT				
Property Tax Revenues as % of Value ³	2.1%	Mid-range	2.0	1.0
Property Tax Revenue Collection Rate	93.3%	Weak	1.0	1.0
OVERALL SCORE			2.0	1.5

¹ Trending toward "Weak" because the rate is 1.8 percentage points more (42% higher) than that of the surrounding region.

² Trending toward "Weak" because the median income in the surrounding region is at least 31% higher, and the gap for Cincinnati, the largest city, is even greater.

³ Trending toward "Weak" because the rate is 25% higher than that of the surrounding region.

17. **Financial Capability.** Using USEPA's method of determining financial capability, the Overall Trend Score of 1.5 in the preceding table falls along the boundary between the "Weak" and "Mid-range" categories in the Financial Capability Matrix found in Table 3 of the aforementioned USEPA Guidance. This ambiguity can be avoided by employing a modification of USEPA's matrix that converts the simplified 3 by 3 matrix into a continuous scale. In such a scale, the boundary between "Medium Burden" and "High Burden" is determined by a simple ratio between the "Cost per Household as a Percentage of Median Household Income" and the "Capability Indicators Score." This can be stated as: *If Cost per Household as a Percentage of Median Household Income is greater than the Capability Indicators Score, the proposed program imposes a High Burden.* For the MSD Area, the Cost per Household as a percentage of MHI is 2.05 using the Standard Effort Program, which is higher than both the Initial Score and the Trend Score, which would place MSD in the "High Burden" category.
18. Another advantage of using this scale is that it provides a consistent method both for measuring burden and for determining the amount of additional program costs that a community's residents are able to afford. Because "High Burden" situations, by definition, create substantial adverse impacts on communities, the upper limit on the Cost per Household as a percentage of MHI should be the same as the Capability Indicators Score, thus ensuring that the burden on a community will not exceed the threshold of the "High Burden" category. Accordingly, the cost per household should be limited to 1.5 percent of median household income.
19. **Household Affordability.** Estimates developed for MSD and set forth in the declaration of Clyde Wilber indicate that total MSD Annual Program Costs would rise from their current \$129.5 million to \$342.2 million for a Standard Effort program and \$617.7 million for a Maximum Effort program.
20. Per Household Costs for each of these programs are calculated in the following manner.
- An estimated 296,121 households are receiving residential sewer service from MSD. MSD's figure for residential accounts was increased by an additional 46.25% to account for multiple household unit structures. (The 46.25% is based on the ratio of units by structure type in the 2000 Census.)
 - Total residential use is estimated at 67.3% of total system use. Because 3+ unit structures are billed as commercial, the residential use figures in the rate study were increased by 37% to account for households living in these units. This assumes household use in these units is 80% of the level of use by other households (based on average household size).
21. When these costs are allocated according to anticipated future use, the annual cost per household rises from the current level of \$294 to \$937 (an increase of 318%) using the Standard Effort figures, and \$1,797 (an increase of 611%) using the Maximum Effort figures. (See following table.) These are dramatic increases that call for careful examination of their economic impacts. An alternative to the Standard and Maximum Effort programs would be to structure a program on the basis of financial capability, using the 1.5 percent of median household income threshold.

Current and Total Annual Program Costs			
	Current	Future - Standard Effort	Future - Maximum Effort
Total Cost	\$129,460,000	\$342,242,000	\$617,689,000
Residential Cost *	\$ 87,127,000	\$277,415,000	\$532,204,000
Per Household Cost	\$294	\$937	\$1,797

* This calculation allocates 67.3% of current costs to residential and 92.5% of projected costs to residential, since industrial sources are not expected to contribute to future revenue growth.

22. Any analysis that utilizes median household income (MHI) as a standard should recognize that a MHI-based rate means that half of all households will be spending more than this percentage. Because income distribution is uneven, this means the impact is disproportional, with poorer communities sometimes experiencing substantially greater financial burdens relative to their ability to pay. The table below includes calculations for Cincinnati, the largest city in MSD's area, Lincoln Heights, the city/village with the lowest reported MHI, and the urban core, which includes roughly one fourth of Cincinnati's households.

Cost as Percent of Median Household Income				
	MSD Area	Cincinnati	Lincoln Hts.	Urban core
Households	296,121	147,979	1,599	34,772
2000 Median Household Income	\$37,930	\$29,493	\$19,834	\$16,677
- CPI Adjustment Factor	3.74%	4.08%	3.74%	3.74%
Adjusted Median Household Income	\$39,348	\$30,697	\$20,576	\$17,301
Cost per Household as % of MHI				
Current (\$294)	0.7%	1.0%	1.4%	1.7%
@ Standard Level (\$937)	2.4%	3.1%	4.6%	5.4%
@ Maximum Level (\$1,797)	4.6%	5.9%	8.7%	10.4%
@ 1.5% of Cincinnati (\$460)	1.2%	1.5%	2.2%	2.7%

23. Another way to assess the affordability of various program levels is to consider the proportion of households in various communities for whom the average cost would be greater than 1.5 percent of their household income. As the table below shows, even a program pegged at 1.5 percent of Cincinnati's MHI would create some hardships in lower income communities, and any program with an average household cost of more than \$460 would impose a substantial and widespread economic burden. These levels of burden would appear to be excessive based on the USEPA guidance.

Percent of households for which the specified sewer cost would be greater than 1.5% of household income					
		MSD Area	Cincinnati	Lincoln Hts.	Urban core
Current	(\$294)	25%	33%	48%	51%
@ Standard Level	(\$937)	74%	83%	88%	94%
@ Maximum Level	(\$1,797)	91%	94%	98%	98%
@ 1.5% of Cincinnati	(\$460)	40%	50%	65%	69%

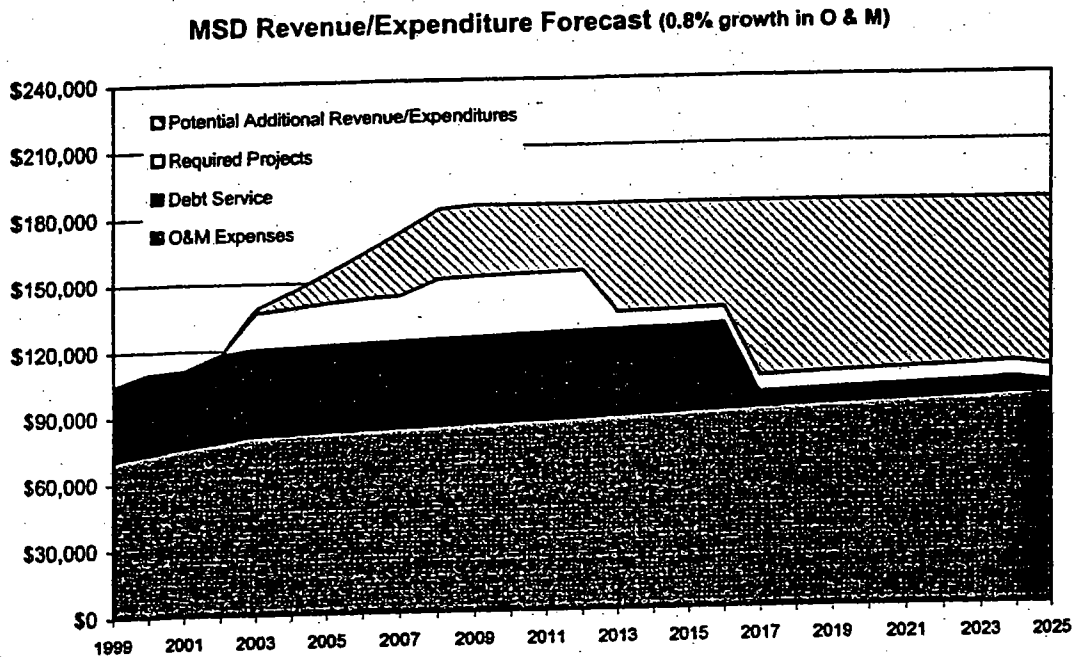
24. Even an increase to 1.5 percent of Cincinnati's MHI will have several significant impacts on MSD and its ratepayers. Three important ones follow.
25. **Loss of Households.** Rate increases will increase the loss of households. An August 1997 study (<http://www-cpr.maxwell.syr.edu/metro/pdf/186.pdf>), conducted by the Center for Policy Research at Syracuse University on the economic and fiscal impact of sewer programs in that community, calculated that an increase of 0.4 percentage points (e.g., 1.0% to 1.4%) in the cost per household as a percentage of MHI would result in a 0.5 percent decrease in population. If this impact were linear over a larger increase, a doubling of MSD's current rates would, by itself, produce a 1 percent decline in its household base.
26. **Increasing Burden of Fixed Costs on a Decreasing Customer Base.** As population and household levels drop, MSD will be forced to increase rates to the remaining households in order to cover its costs of providing service, which will result in additional increases in the cost per household.
27. **Net Revenues Lag Behind Projected Revenues.** In MSD's 1999 Rate Study, revenue growth was projected for 2000 and 2001 on the basis of anticipated rate increases. The revenue growth rate over this two-year period was projected to average 8.4 percent per year, but the actual growth averaged only 5.7 percent per year. This shortfall presents serious challenges both in setting rates and in raising revenue. There are economic reasons to explain why this occurs in both industrial revenue and household revenue.
- a. **Industrial Revenue.** The recent history of increased rates on industry indicates that rate increases in this area are likely to be revenue neutral. That is, as rates increase, industry has responded by using less water and by doing its own pre-treatment to reduce or avoid surcharges (as illustrated by the following table). In addition, even during the recent economic expansion, the number and average size of manufacturing establishments in Hamilton County were declining (both by more than 10% between March 1994 and March 2000). As a result, increasing rates is not expected to produce any additional revenue.

Industrial Surcharges	1997	2001	Change
Total Charges	\$11,464,367	\$9,507,858	-\$1,956,509
Charges for Top 3 Firms	\$5,734,574	\$3,838,382	-\$1,896,192
Firms with Charges in Both Years	\$11,190,481	\$8,934,309	-\$2,256,172

- b. **Household Revenue.** As discussed above, increased rates are expected to marginally reduce the number of occupied households, over and above the current declining population trend. In addition, as rates become a substantial economic burden on lower income ratepayers, it can be expected that the collection rate will drop and less revenue will be obtained overall. As a result, the ability of rate increases to raise additional revenue has practical limits.
28. **New Sewer Connections.** From an economic perspective, sewer moratoria can create adverse impacts. New sewer connections provide new revenue to fund the very programs that reduce

the volume of overflows. Due to the revenue lost, sewer moratoria are counter-productive to the reduction of overflows because they reduce the funding needed to control overflow. For example, if MSD had experienced a 5-year moratorium from 1995 to 2000, most of the 39,000 housing units constructed in the County during that period would not have been built or connected to MSD sewers, and would not be contributing revenue for MSD's operations. These units are estimated to contribute approximately \$9 million to current annual revenues.

29. Implications for MSD in Implementing Wastewater Programs. Based on this analysis, how much money can MSD raise from rate increases for implementing additional wastewater programs? At 1.5 percent of Cincinnati's Median Household Income (\$460 per household), MSD can invest another \$1,111 million over the next 23 years if rates are increased at 7 percent per year. Presently, MSD is committed to a number of projects in the next several years. As a result, MSD will have limited financial capability for the next ten years. The following graph illustrates this constraint.



29. This forecast of reaching a revenue/expenditure level of slightly more than \$180 million annually is dependent on several important assumptions: 1) a stable customer base; 2) a stable level of use; and 3) a stable payment rate. If higher sewer rates cause a significant decline in one or more of these figures, the actual revenues will be reduced proportionately.

01/08/2003 15:56 5135562953

CENTER FOR ECON ED

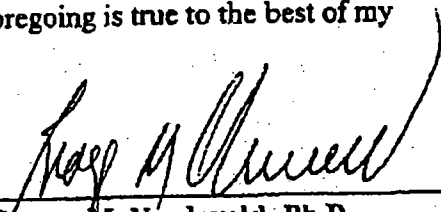
PAGE 02

30. The following table shows the outlook for MSD in terms of anticipated revenues (based on a 7% annual rate increase), existing expenditure commitments, and remaining available funds through the year 2025. Because of commitments to required projects through 2012 and to existing debt service through 2016, the figures for available funds are limited in the immediate future.

	Revenues (in \$000s)	Expenditures (in \$000s)	Available Funds (in \$000s)
2003-2007	\$773,000	\$700,000	\$73,000
2008-2012	\$918,000	\$762,000	\$156,000
2013-2017	\$920,000	\$644,000	\$276,000
2018-2022	\$920,000	\$533,000	\$387,000
2023-2025	\$652,000	\$326,000	\$226,000

I swear under the penalty of perjury that the foregoing is true to the best of my knowledge and belief.

Executed on this day the 8th of January, 2003.


George M. Vredeveld, Ph.D.

George M. Vredevelde

Professor of Economics

Director, Economics Center for Education & Research

University of Cincinnati

PO Box 210223

Cincinnati, OH 45221-0223

(513) 556-2950 Telephone

(513) 556-2953 Fax

george.vredevelde@uc.edu

Education

A.B., *Political Science*, Calvin College, 1964

M.A.T., *Economics*, Purdue University, 1968

Ph.D., *Economics*, Indiana University, 1973

Past Employment

Visiting Professor of Economics, European Institute of Public Administration, Maastricht, the Netherlands, 1990-1991.

Associate Professor of Economics and Director of the Greater Cincinnati Center for Economic Education, University of Cincinnati, 1977-1990.

Assistant Professor of Economics and Executive Director of the Missouri Council on Economic Education, University of Missouri, 1975-1977.

Assistant Professor of Economics and Director of the Center for Economic Education, University of Missouri, 1972-1975.

Graduate Research Fellow, Institute of Applied Urban Economics, Indiana University, 1971-1972.

Visiting Lecturer in Economics, Purdue University, 1968-1969.

Fellowships and Awards

Experienced Teacher Fellowship, Purdue University, 1967-1968.

N.D.E.A. Fellowship, Indiana University, 1969-1971.

Senior Fellowship, Center for Applied Manpower and Occupational Studies (honorary), Indiana University, 1971-1972.

Research Fellowship, Institute of Applied Urban Economics, Indiana University, 1971-1972.

Henry M. Oliver Theory Award, Indiana University, 1973.

Teaching Award, International Paper Company Foundation, Honorable Mention, 1975.

Teaching Award, International Paper Company Foundation, 3rd place, 1979.

Outstanding Educators' Award, Consumer Economic Education Association of Ohio, 1985.

Pew Summer Visiting Research Fellow, Economics Department, Princeton University, 1987.

Roman F. Warmke Award for Excellence and Leadership in Economic Education, Ohio Council on Economic Education, 1995.

Publications

Books

Economics, with D.R. Karmerschen, Cliff Publishing Inc., Lincoln, Nebraska, 1975.

Choice: A Handbook of Classroom Ideas to Motivate the Teaching of Elementary Economics, with John Lewis, Peter Harrington and Peter Meyers, Educational Services, Inc., Stevensville, Michigan, 1975.

Children in the Marketplace: Economics for Grades 5-6, Joint Council on Economic Education, New York, NY, 1989.

Articles

"Testing for Economic Biases" with A. Bopp and M. Borland, *Journal of Economics*, Missouri Valley Economics Association, 1974, pp. 20-24.

"Income Inequality and Subsidizing Higher Education" in *The Costs and Benefits of Education*, Robert D. Leiter, ed., Twayne Publishers, 1975, pp. 20-24.

"Economic Education: It's Your Business" in *Business and Government Outlook*, University of Missouri-Columbia, Spring 1976, pp. 9-11.

"In-Service Teacher Education and Student Performance" in *Journal of Economics Education*, Vol. 8, No. 2, Spring, 1977, with Dan Thorton, pp. 93-99.

"A Rationale for Government Intervention in Housing: Impact of Government Non-Housing Policies on the Housing and Mortgage Markets," in *Housing in the Seventies*, Vol. II, GPO, Washington, D.C., 1977 with D. Ramsey, pp. 421-438.

"Distributional Impacts of Alternative Methods of Financing Higher Education" in *Journal of Higher Education*, Vol. 49, No. 1, January/February, 1978, pp. 47-69.

"Economics for Teachers of Indian Children," in *Innovative Ideas in Introductory Economics*, A. Nappi, ed., Joint Council on Economic Education, New York, New York, 1980, with W. Vannette.

"Economics and Programmed Instruction" in *Journal of Economic Education*, Vol. 13, No. 2, Summer 1982, pp. 14-25.

"Economics: Musing or Reality, Some Thoughts on Bergmann's Methodology" in *Journal of Economic Education*, 1987 Vol. 18, No. 2, Spring 1987.

"Will Tax Reform Work" in *Senior Economist*, Joint Council on Economic Education, October 1987.

"European Stagnation: Is 1992 the Answer?" in *The Future of Private Enterprise*, Vol. 6, 1989.

"Europe 1992: Teaching Activities" in *Senior Economist*, Winter 1989 with Charlotte Eicher.

"Market Efficiency and Student-Teacher Goal Agreement in the High School Economics Course: A Simultaneous Choice Modeling Approach," *Journal of Economic Education*, Vol. 21, No. 3, Summer 1990, pp. 317-33 with Jin-Ho Jeong.

Articles (continued)

"Educational Reform and Economic Transition in Bulgaria," in Report of Bulgarian Economic Growth & Transition Project, edited by Richard W. Rahn and Ronald D. Utt, National Chamber Foundation, Washington, 1990.

"Economic Education and Transition in Eastern Europe," in An International Perspective on Economic Education, William Walstad, editor, Kluwer Academic Publishers, Boston, 1994, with Dimitrina Ispirodonova.

"The Single European Market and its Effect on the World," in European Unification: A Conceptual Guide for Educators, Steven L. Miller, editor, ERIC Clearinghouse for Social Studies/Social Science Education, Bloomington, Ind., 1995, pp. 111-126.

"Building Infrastructure to Provide Economic Education in Eastern Europe," in Delivering Economic and Business Education in an International Setting, William Walstad and Jenny Wales, editors, Economics and Business Education Association, London, 1996, with Dimitrina Ispirodonova.

"Economic Education Reform in Bulgaria," in Reforming Economics and Economics Teaching in the Transition Economies: From Marx to Markets in the Classroom. Michael Watts and William B. Walstad, Eds. Edward Elgar Publishing, North Hampton, 2002, pp. 131-143, with Barbara Phipps and Antoanetta Voikova.

Technical Reports

The Redistributive Effects of Subsidizing Higher Education in Missouri with Robert Collins, Report for the Missouri Coordinating Board of Higher Education, September 1975.

The Greater Cincinnati Airport: An Economic Impact Study With C.A. Berry, G. Burgess and J.R. Clark, prepared for the Greater Cincinnati Chamber of Commerce, July, 1988.

Economic Trends and Projections: Background for Targeting Industries with C.A. Berry, G. Burgess and J.R. Clark, prepared for the Greater Cincinnati Chamber of Commerce, September 1988.

Hospitals' Impact on the Greater Cincinnati Economy with Greg Burgess, prepared for the Hospital Council and Greater Cincinnati Center for Economic Education, October 1989.

Mega Projects Analysis: Capital Improvements Budget, City of Cincinnati and Hamilton County, March 1993, with J.R. Clark.

Business and Economics Taxation Sourcebook, George L. Strike Journalism Program, University of Cincinnati, 1994, 68 pp.

Re-thinking Work force Dynamics, George L. Strike Journalism Program, December 1994, 50pp.

Economic Impact of the Greater Cincinnati/Northern Kentucky International Airport: The Next 20 Years, Kenton County Airport Board, April 1995, with Lee Cerveny.

The Role of Downtown in a Regional Economy, Downtown Cincinnati Inc., with Lee Cerveny September 1995.

Cincinnati Economy: Downtown and the Region, Downtown Cincinnati Inc., with Lee Cerveny, September 1995.

The Economic Impact of the Construction and Operation Two Sports Stadia in Downtown Cincinnati, Hamilton County, January 1996, with Lee Cerveney and Marie Haney.

The Construction and Operation of an Aquarium in Greater Cincinnati, Aquarium Holdings, Inc. February, 1996, with Marie Haney.

Greater Cincinnati's Target Industries, Cincinnati Gas and Electric Company, with Marie Haney, September 1996.

The Economic Impact of Delta Airlines on the Greater Cincinnati Economy, Delta Airlines, Inc., with Marie Haney, December 1996.

Elderly Services Program Tax Levy Review, Hamilton County, with Marie Haney, June 1997.

Characteristics of Employment Opportunities in Greater Cincinnati, Greater Cincinnati Center for Economic Education, with Marie Haney, November 1997.

Economic and Demographic Characteristics of Western Hamilton County, J.P. Thelen & Associates, with Marie Haney, August 1998.

The Child Care Study -- The Economic Effects on Hamilton County, Ohio, Hamilton County, with Marie Haney, August 1998.

Economic and Demographic Characteristics of Western Hamilton County, Western Economic Council, with Marie Haney, August 1998.

Generating Knowledge about Housing, Ohio State University, with Scott Merusi, November 1998.

The Tax Revenue Impact of Adopting the Sponge Tax in Ohio, Ohio Bar Association, with Marie Haney, February 1999.

The Economic Impact of Rickenbacker International Airport and Foreign Trade Zone.138, Rickenbacker Port Authority, with Marie Haney, February 1999.

Characteristics of Labor Supply in Greater Cincinnati, Greater Cincinnati Center for Economic Education, with Marie Haney and Constantine Apostolites, April, 1999.

An Evaluation of the Economic Benefits of the Taft Career Academic Program, Cincinnati Youth Collaborative, with David Bowes, November 1999.

The Economic Impact of the Olympic Games on the Tri State Region, Cincinnati 2012, March 2000.

Homeowner Tax Credit Analysis, Southbank Partners, with Jeff Rexhausen, October 2001.

Presented Papers

"Financing Higher Education and Income Distribution," Missouri Economics Association, Columbia, Missouri, December 1971.

"Income Inequality and Subsidizing Higher Education," Conference on Costs and Benefits of Education, New York, New York, May 1973.

"Distributional Impacts of Alternative Methods of Financing Higher Education," Regional Science Association, Atlanta, Georgia, November 1973.

"The Economics of Financing Education," Department of Economics and Business, Northwest Missouri State University, February 1973.

"Testing for Economic Biases," Missouri Valley Economics Association, October 1974.

"Whatever Happened to Programmed Learning?" Eastern Economics Association, Washington, D.C., April 1978.

"Community-based Economic Education," National Association of Affiliated Economic Education Directors, Portland, Oregon, October 1978.

"Community Resources and Economic Education," National Association of Industry and Education Cooperation, Ft. Thomas, Ky., May 1979.

"Economics and Career Decisions," Ohio Association of Career Education, Columbus, Ohio, May 1980.

"CPI, Inflation, Cost of Living and Public Policy," Ohio Association of Economists and Political Scientists, May 1980.

"Developing and Sustaining Economics Education Programs," American Association of Educational Research, Los Angeles, California, March 1981.

"Relating Economics to Work and Labor Markets," National Industry/Education Conference, Cincinnati, May 1983.

"The Role of Normative Economics in Economic Education," National Association of Economic Educators, October 1985.

"Economics and Methodology: Comments on Barbara Bergmann's Measurement or Finding Things Out in Economics," The Scope of Economics Conference, Massachusetts Institute of Technology, Cambridge, Mass., September 1986.

"Funding Education in Ohio: What are the Inefficiencies of Mandates," presentation to the Gillmore-Schafrath Legislative Commission, State of Ohio, September 1987.

"The Efficiency Question in Producing Economic Knowledge," Eastern Economics Association, Boston, Mass., March 1988.

"Eurosclerosis: Will Integration be a Cure?" Association of Private Enterprise Education, Orlando, Florida, April 1989.

"Efficiency in Providing Economics Teaching," National Association of Economic Educators, Atlanta, Georgia, October 1989.

Presented Papers (Continued)

"Transition in Eastern Europe: The Role of Education," National Association of Economic Educators, Louisville, October 1991.

"The Bulgarian Economic Reform: Achievements and Challenges," presented at the American Economic Association, New Orleans, 1993, with Boyan Slavenkov.

"The Process of Economic Reorganization in Russia," presented at National Association of Economic Educators, Milwaukee, October 1993 with L. Oborotova and A. Tsapin.

"Teaching Economics Using a Minimalist's Approach," presented at South East Asia Teachers' and Counselors' Conference, Jakarta, November 1994.

"Economics as a Tool for Understanding Human Behavior," presented at South East Asia Teachers' and Counselors' Conference, Jakarta, November 1994.

"The Role of Economic Education in the Eastern European Transition," International Conference on New Developments in Secondary Economics and Business Education, Liverpool, England, April 1995.

"Economic Impact of Construction Projects: A Case Study of Sports Stadia," presented at North Central Sociological Association, Cincinnati, March 1996.

"Evaluating the Evaluation of Economics Education in Bulgaria," presented at the National Association of Economic Education, Honolulu, September 1996, with Gisela Escoc.

"Evaluating Progress in Economics Teaching," presented at the Society of Economic Educators, Tampa, Florida, March 2001.

Offices Held In Professional Organizations

Executive Committee and President-elect, National Association of Economic Educators, 2002 to present

Executive Committee, National Association of Economic Educators, 1979-83.

Executive Committee, Ohio Council on Economic Education, 1980 to 1996.

Trustee, Academy for Economic Education, 1981 to 1992.

Chairman, Council on Academic Urban Programs, 1983-84.

Business and Community

Board of Directors, Ohio National Mutual Funds, 1995 to present

Board of Directors, Benchmark Federal Savings Bank, 1982-1999

Panel Member, Greater Cincinnati Chamber of Commerce Economic Outlook, 1987 to present

Member, Cincinnati Enquirer's Board of Economist, 1992 to present

Board Member, Queen City Association, 1991 to 2000

TAB C

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]